

WHAT IS CLAIMED IS:

- 1 1. A method for encrypting a data stream of video information encoded and compressed into
2 a base layer and at least one enhancement layer, including the steps of:
3 (a) selecting at least one encryption algorithm;
4 (b) selecting at least one unit of one of the base layer or at least one enhancement layer
5 to encrypt; and
6 (c) applying at least one selected encryption algorithm to encrypt each selected unit into
7 an encrypted unit.
- 1 2. The method of claim 1, further including instructions for causing the computer to
2 preferentially selecting units to encrypt that will confound decompression or decoding of
3 subsequent units that depend on information in such encrypted units.
- 1 3. The method of claim 1, wherein at least one selected unit is a multi-frame unit.
- 1 4. The method of claim 1, wherein at least one selected unit is a frame unit.
- 1 5. The method of claim 1, wherein at least one selected unit is a sub-frame unit.
- 1 6. The method of claim 1, wherein at least one selected unit is a distributed unit.
- 1 7. The method of claim 1, further including the steps of applying a first unique selected
2 encryption algorithm to selected units from the base layer and a second unique selected
3 encryption algorithm to selected units from at least one enhancement layer.
- 1 8. The method of claim 1, further including instructions for causing the computer to
2 decrypting each encrypted unit.
- 1 9. The method of claim 1, further including instructions for causing the computer to
2 decrypting a plurality of encrypted units in parallel.

1 10. The method of claim 1, wherein the at least one selected encryption algorithm differs
2 between at least two units.

1 11. The method of claim 1, wherein each selected encryption algorithm has a key having a
2 key length, and further including instructions for causing the computer to varying at least
3 one of a value for the key and the key length for at least some of the selected units.

1 12. The method of claim 1, further including the steps of:

2 (a) encrypting a subset of selected units from the data stream of video information to
3 create an encrypted custom distribution copy;

4 (b) grouping the remaining units from the data stream of video information to create a
5 bulk distribution copy; and

6 (c) distributing the bulk distribution copy separately from the encrypted custom
7 distribution copy.

1 13. The method of claim 1, wherein each selected encryption algorithm has a key generated
2 from at least one or more of the following factors: a previous key; a serial number of a
3 destination decoding device; a date or time range determined by a secure clock; a location
4 identifier; the number of previous uses of a work; a PIN of a specific authorizing person;
5 or portions of a previously encrypted data stream of video information.

1 14. The method of claim 1, wherein each selected encryption algorithm has a key, and further
2 including the steps of:

3 (a) storing a plurality of encrypted units on an erasable media; and

4 (b) erasing the encrypted units upon expiration of the keys.

1

1 15. A method for watermarking a data stream of video information encoded and compressed
2 into a base layer and at least one enhancement layer, including the steps of:

- 3 (a) selecting at least one watermarking technique;
4 (b) selecting at least one unit of one of the base layer or at least one enhancement layer
5 to watermark; and
6 (c) applying at least one selected watermarking technique to watermark each selected
7 unit as a watermarked unit.

1 16. The method of claim 15, further including instructions for causing the computer to
2 preferentially selecting units to watermark that will have low influence on other units, so
3 as to minimize visibility of the watermark.

1 17. The method of claim 15, wherein at least one selected unit is a multi-frame unit.

1 18. The method of claim 15, wherein at least one selected unit is a frame unit.

1 19. The method of claim 15, wherein at least one selected unit is a sub-frame unit.

1 20. The method of claim 15, wherein at least one selected unit is a distributed unit.

1 21. The method of claim 15, wherein the data stream of video information includes
2 displayable frames, and further including instructions for causing the computer to
3 applying the selected watermark techniques to watermark a periphery of each displayable
4 frame, so as to minimize visibility of the watermarks.

1 22. The method of claim 15, further including the steps of applying a first unique selected
2 watermarking technique to selected units from the base layer and a second unique
3 selected watermarking technique to selected units from at least one enhancement layer.

1 23. The method of claim 15, wherein at least one watermarking technique is a noise-tolerant
2 watermarking technique.

1 24. The method of claim 15, wherein at least one watermarking technique applies a uniquely
2 identifying symbol or code to each data stream of video information.

1 25. The method of claim 15, wherein at least one watermarking technique applies a uniquely
2 identifying symbol or code to each layer of the data stream of video information.

1 26. The method of claim 15, wherein one watermarking technique uses non-optimum motion
2 vectors as a watermark.

1 27. The method of claim 15, wherein one watermarking technique uses minor rate control
2 variations as a watermark.

1 28. The method of claim 15, wherein one watermarking technique uses low-order bit
2 variations in DC coefficients or AC coefficients of the data stream as a watermark.

1 29. The method of claim 15, wherein one watermarking technique uses low amplitude blurry
2 symbols uniquely added to the data stream of video information during compression to
3 uniquely watermark the data stream.

1
2
3
4
5
6
7
8
9
10
11
12
13
1

- 4
5
6
7
8
9
10
11
12
13
1

1 31. A system for encrypting a data stream of video information encoded and compressed into
2 a base layer and at least one enhancement layer, including:

- 3 (a) means for selecting at least one encryption algorithm;
4 (b) means for selecting at least one unit of one of the base layer or at least one
5 enhancement layer to encrypt; and
6 (c) means for applying at least one selected encryption algorithm to encrypt each
7 selected unit into an encrypted unit.

1 32. The system of claim 31, further including means for preferentially selecting units to
2 encrypt that will confound decompression or decoding of subsequent units that depend on
3 information in such encrypted units.

1 33. The system of claim 31, wherein at least one selected unit is a multi-frame unit.

1 34. The system of claim 31, wherein at least one selected unit is a frame unit.

1 35. The system of claim 31, wherein at least one selected unit is a sub-frame unit.

1 36. The system of claim 31, wherein at least one selected unit is a distributed unit.

1 37. The system of claim 31, further including means for applying a first unique selected
2 encryption algorithm to selected units from the base layer and a second unique selected
3 encryption algorithm to selected units from at least one enhancement layer.

1 38. The system of claim 31, further including means for decrypting each encrypted unit.

1 39. The system of claim 31, further including means for decrypting a plurality of encrypted
2 units in parallel.

1 40. The system of claim 31, wherein the at least one selected encryption algorithm differs
2 between at least two units.

1 41. The system of claim 31, wherein each selected encryption algorithm has a key having a
2 key length, and further including means for varying at least one of a value for the key and
3 the key length for at least some of the selected units.

1 42. The system of claim 31, further including:

- 2 (a) means for encrypting a subset of selected units from the data stream of video
3 information to create an encrypted custom distribution copy;
4 (b) means for grouping the remaining units from the data stream of video information to
5 create a bulk distribution copy; and
6 (c) means for distributing the bulk distribution copy separately from the encrypted
7 custom distribution copy.

1 43. The system of claim 31, wherein each selected encryption algorithm has a key generated
2 from at least one or more of the following factors: a previous key; a serial number of a
3 destination decoding device; a date or time range determined by a secure clock; a location
4 identifier; the number of previous uses of a work; a PIN of a specific authorizing person;
5 or portions of a previously encrypted data stream of video information.

1 44. The system of claim 31, wherein each selected encryption algorithm has a key, and
2 further including:

- 3 (a) means for storing a plurality of encrypted units on an erasable media; and
4 (b) means for erasing the encrypted units upon expiration of the keys.

1 45. A system for watermarking a data stream of video information encoded and compressed
2 into a base layer and at least one enhancement layer, including:

- 3 (a) means for selecting at least one watermarking technique;
4 (b) means for selecting at least one unit of one of the base layer or at least one
5 enhancement layer to watermark; and
6 (c) means for applying at least one selected watermarking technique to watermark each
7 selected unit as a watermarked unit.

1 46. The system of claim 45, further including means for preferentially selecting units to
2 watermark that will have low influence on other units, so as to minimize visibility of the
3 watermark.

1 47. The system of claim 45, wherein at least one selected unit is a multi-frame unit.

1 48. The system of claim 45, wherein at least one selected unit is a frame unit.

1 49. The system of claim 45, wherein at least one selected unit is a sub-frame unit.

1 50. The system of claim 45, wherein at least one selected unit is a distributed unit.

1 51. The system of claim 45, wherein the data stream of video information includes
2 displayable frames, and further including means for applying the selected watermark
3 techniques to watermark a periphery of each displayable frame, so as to minimize
4 visibility of the watermarks.

1 52. The system of claim 45, further including means for applying a first unique selected
2 watermarking technique to selected units from the base layer and a second unique
3 selected watermarking technique to selected units from at least one enhancement layer.

1 53. The system of claim 45, wherein at least one watermarking technique is a noise-tolerant
2 watermarking technique.

1 54. The system of claim 45, wherein at least one watermarking technique applies a uniquely
2 identifying symbol or code to each data stream of video information.

1 55. The system of claim 45, wherein at least one watermarking technique applies a uniquely
2 identifying symbol or code to each layer of the data stream of video information.

1 56. The system of claim 45, wherein one watermarking technique uses non-optimum motion
2 vectors as a watermark.

1 57. The system of claim 45, wherein one watermarking technique uses minor rate control
2 variations as a watermark.

1 58. The system of claim 45, wherein one watermarking technique uses low-order bit
2 variations in DC coefficients or AC coefficients of the data stream as a watermark.

1 59. The system of claim 45, wherein one watermarking technique uses low amplitude blurry
2 symbols uniquely added to the data stream of video information during compression to
3 uniquely watermark the data stream.

1

- 1 60. A system for encrypting and watermarking a data stream of video information encoded
2 and compressed into a base layer and at least one enhancement layer, including:
3 (a) means for selecting at least one encryption algorithm;
4 (b) means for selecting at least one watermarking technique;
5 (c) means for selecting at least one unit of one of the base layer or at least one
6 enhancement layer to encrypt;
7 (d) means for selecting at least one unit of one of the base layer or at least one
8 enhancement layer to watermark;
9 (e) means for applying at least one selected watermarking technique to watermark each
10 selected unit as a watermarked unit; and
11 (f) means for applying at least one selected encryption algorithm to encrypt each
12 selected unit into an encrypted unit.

1 61. A computer program, stored on a computer-readable medium, for encrypting a data
2 stream of video information encoded and compressed into a base layer and at least one
3 enhancement layer, the computer program comprising instructions for causing a computer
4 to:

5 (a) select at least one encryption algorithm;

6 (b) select at least one unit of one of the base layer or at least one enhancement layer to
7 encrypt; and

8 (c) apply at least one selected encryption algorithm to encrypt each selected unit into an
9 encrypted unit.

1 62. The computer program of claim 61, further including instructions for causing the
2 computer to preferentially select units to encrypt that will confound decompression or
3 decoding of subsequent units that depend on information in such encrypted units.

1 63. The computer program of claim 61, wherein at least one selected unit is a multi-frame
2 unit.

1 64. The computer program of claim 61, wherein at least one selected unit is a frame unit.

1 65. The computer program of claim 61, wherein at least one selected unit is a sub-frame unit.

1 66. The computer program of claim 61, wherein at least one selected unit is a distributed unit.

1 67. The computer program of claim 61, further including instructions for causing the
2 computer to apply a first unique selected encryption algorithm to selected units from the
3 base layer and a second unique selected encryption algorithm to selected units from at
4 least one enhancement layer.

1 68. The computer program of claim 61, further including instructions for causing the
2 computer to decrypt each encrypted unit.

1 69. The computer program of claim 61, further including instructions for causing the
2 computer to decrypt a plurality of encrypted units in parallel.

1 70. The computer program of claim 61, wherein the at least one selected encryption
2 algorithm differs between at least two units.

1 71. The computer program of claim 61, wherein each selected encryption algorithm has a key
2 having a key length, and further including instructions for causing the computer to vary at
3 least one of a value for the key and the key length for at least some of the selected units.

1 72. The computer program of claim 61, further including instructions for causing the
2 computer to:

- 3 (a) encrypt a subset of selected units from the data stream of video information to create
4 an encrypted custom distribution copy;
5 (b) group the remaining units from the data stream of video information to create a bulk
6 distribution copy; and
7 (c) distribute the bulk distribution copy separately from the encrypted custom
8 distribution copy.

1 73. The computer program of claim 61, wherein each selected encryption algorithm has a key
2 generated from at least one or more of the following factors: a previous key; a serial
3 number of a destination decoding device; a date or time range determined by a secure
4 clock; a location identifier; the number of previous uses of a work; a PIN of a specific
5 authorizing person; or portions of a previously encrypted data stream of video
6 information.

1 74. The computer program of claim 61, wherein each selected encryption algorithm has a
2 key, and further including instructions for causing the computer to:

- 3 (a) store a plurality of encrypted units on an erasable media; and
4 (b) erase the encrypted units upon expiration of the keys.

1 75. A computer program, stored on a computer-readable medium, for watermarking a data
2 stream of video information encoded and compressed into a base layer and at least one
3 enhancement layer, the computer program comprising instructions for causing a computer
4 to:

- 5 (a) select at least one watermarking technique;
6 (b) select at least one unit of one of the base layer or at least one enhancement layer to
7 watermark; and
8 (c) apply at least one selected watermarking technique to watermark each selected unit
9 as a watermarked unit.

1 76. The computer program of claim 75, further including instructions for causing the
2 computer to preferentially select units to watermark that will have low influence on other
3 units, so as to minimize visibility of the watermark.

1 77. The computer program of claim 75, wherein at least one selected unit is a multi-frame
2 unit.

1 78. The computer program of claim 75, wherein at least one selected unit is a frame unit.

1 79. The computer program of claim 75, wherein at least one selected unit is a sub-frame unit.

1 80. The computer program of claim 75, wherein at least one selected unit is a distributed unit.

1 81. The computer program of claim 75, wherein the data stream of video information
2 includes displayable frames, and further including instructions for causing the computer
3 to apply the selected watermark techniques to watermark a periphery of each displayable
4 frame, so as to minimize visibility of the watermarks.

1 82. The computer program of claim 75, further including instructions for causing the
2 computer to apply a first unique selected watermarking technique to selected units from

the base layer and a second unique selected watermarking technique to selected units from at least one enhancement layer.

83. The computer program of claim 75, wherein at least one watermarking technique is a noise-tolerant watermarking technique.

84. The computer program of claim 75, wherein at least one watermarking technique applies a uniquely identifying symbol or code to each data stream of video information.

85. The computer program of claim 75, wherein at least one watermarking technique applies a uniquely identifying symbol or code to each layer of the data stream of video information.

86. The computer program of claim 75, wherein one watermarking technique uses non-optimum motion vectors as a watermark.

87. The computer program of claim 75, wherein one watermarking technique uses minor rate control variations as a watermark.

88. The computer program of claim 75, wherein one watermarking technique uses low-order bit variations in DC coefficients or AC coefficients of the data stream as a watermark.

89. The computer program of claim 75, wherein one watermarking technique uses low amplitude blurry symbols uniquely added to the data stream of video information during compression to uniquely watermark the data stream.

- 1 90. A computer program, stored on a computer-readable medium, for encrypting and
2 watermarking a data stream of video information encoded and compressed into a base
3 layer and at least one enhancement layer, the computer program comprising instructions
4 for causing a computer to:
- 5 (a) select at least one encryption algorithm;
 - 6 (b) select at least one watermarking technique;
 - 7 (c) select at least one unit of one of the base layer or at least one enhancement layer to
8 encrypt;
 - 9 (d) select at least one unit of one of the base layer or at least one enhancement layer to
10 watermark;
 - 11 (e) apply at least one selected watermarking technique to watermark each selected unit
12 as a watermarked unit; and
 - 13 (f) apply at least one selected encryption algorithm to encrypt each selected unit into an
14 encrypted unit.